(12) UK Patent Application (19) GB (11) 2 058 820 A

(21) Application No 8029002
(22) Date of filing 8 Sep 1980
(30) Priority data
(31) 75668
(32) 14 Sep 1979
(33) United States of America (US)
(43) Application published 15 Apr 1981
(51) INT CL³ C09K 3/30
(52) Domestic classification C4X 11
(56) Documents cited None
(58) Field of search C4X
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(54) **Polymer-containing composition for controlling allergens**

(57) A composition and method for controlling dust allergens involves the periodic coating of various host substrates such as fabrics, with a pressurized aqueous coating composition comprising water, an organic solvent, a hydrophobic polymer having a minimum film-forming temperature below about 30°C., a glass transition temperature less than about 20°C., and a propellant.

GB 2 058 820A

SPECIFICATION

Polymer-containing composition for controlling allergens

Dust in the home or "house dust" is the source of troublesome symptoms of allergy for an unknown number of people who may be constantly bothered by sneezing and a runny nose or by wheezing and shortness of breath. The possible harmful effects of house dust have been recognized for some time. More recently the dust fauna, in particular arthropods such as pyroglyphid mites and their debris, received attention in relation to house dust atopy, an important factor in the etiology of bronchial asthma and rhinitis. The symptoms that result from allergy to house dust are usually those of perennial allergic rhinitis, sneezing, runny nose or nasal obstruction, and watery itching eyes. These may be identical to symptoms associated with seasonal hay fever.

Current literature surveys indicate that no recommendations can be given for control of house dust mites. Neither chemical nor sanitary controls are deemed possible due to the lack of knowledge in this field. Moreover, it has been established that most acaracides had little effect at concentrations under one percent which in most instances is too severe a treatment to be used in the household on known areas of high mite density such as bedding, upholstery, etc., where humans are constantly exposed. Moreover, these treatments did not control mite debris, a known allergen.

Therefore, an object of the present invention is to control the allergens found in house dust.

Another object of the invention is to provide a composition for controlling allergens found in fabrics, and this composition is suitable for use around humans.

A further object of the invention is to control the debris of pyroglyphids found in fabrics.

Still another object of the invention is to treat fabrics to restrict the mobility of mites, and mite debris, maintain a low moisture environment around mites and isolate mites from critical nutrients.

Still another object of the invention is to apply a composition for controlling allergens found in fabrics by a means that provides control of the rate of application and the uniformity of said application, such that the fabric can be completely coated yet will dry within a reasonable period of time.

These and other objects of the invention will be apparent from the following description and claims.

The link between pyroglyphid mites, allergy and house dust now suggests that allergy relief can be obtained in a typical household environment by altering the microenvironment of these mites in those specific areas of the household which would have the most significant effect on controlling mite activity. Moreover, such an alteration of the mite's microenvironment can be achieved in a manner which is compatible with exposure to humans.

It has been established that certain areas of a typical household which are characterized by a predominance of fabric being present, such as upholstered furniture, bedding, mattresses and carpeting, provide ideal host microenvironments for pyroglyphid mites. It has now been found that if these fabrics are periodically treated with a composition having certain physical and chemical properties, that the pyroglyphid mite activity on and in those fabrics can be controlled with a corresponding reduction in the allergy potential of those fabrics. It has also been found that the form of the composition is important to the control of pyroglyphid mites and, specifically, control of the rate of application, uniformity of the application and drying time. To this end it has further been found that an aerosol spray of specific compositional constituents is effective in reducing the activity of pyroglyphid mites and in controlling mite debris.

Controlling mite activity includes controlling the biological as well as physical activity of the mite and its debris which includes its chitinous exoskeleton and excrement.

It has been found that controlling the activity of mites can best be achieved by altering the microenvironment of certain fabrics traditionally high in mite density with a coating composition which tends to isolate the mites and/or their exoskeleton and excrement. It has also been found that this type of control reduces allergic responses significantly. In addition, if an appropriate substance is selected to isolate mites and their debris, certain other critical environmental factors such as moisture level and nutrient availability can also be altered which will further control the activity of the mite.

Mite nutrients include human scale, dander, dust fibers and food particles. The isolation of mites from these critical nutrients is achieved by coating certain fabrics found in a household where mites tend to live and reproduce. This coating forms a barrier on the fabric between the mites present and fugitive nutrients which tend to collect on these fabrics after treatment.

Thus, optimum substances for controlling mite activity include coating compositions which—

(a) restrict the mobility of mites and mite debris,

(b) maintain a reduced moisture environment around the mite, and

(c) isolate and/or encumber the mite from critical nutrients,

(d) do not alter the hand or feel of the host substrate, and

(e) disrupt the normal use of the host substrate for a nominally minimum period of time.

It can be appreciated that the host environments for the mite are typically fabric surfaces found around the household. As such, treatment of these surfaces are the most effective means for controlling mite activity.

The compositions of the invention suitable for controlling allergens in fabrics comprise a

pressurized aqueous film-forming composition having—

(a) a minimum film-forming temperature (MFT) below about 30°C.,

(b) contains a polymer or polymers having a glass transition temperature (Tg) less than about 20°C., and

(c) contains a volatile organic solvent, such as a low molecular weight alcohol,

(d) provides a film which is hydrophobic, flexible, continuous, and capable of being removed from the substrate with detergent and water, and

(e) is dispensed from an aerosol container such that a substantially continuous film is formed on the fabric, wherein the film is dry to the touch within minutes and the mite debris present is rendered substantially immobile.

Repetitive applications of coatings of the described composition to certain fabrics in a household have been found to substantially reduce the activity of pyroglyphid mites and their debris with a corresponding reduction in the allergy potential of such fabrics.

The coating

The present invention teaches controlling allergens by periodically coating the various fabrics with a pressurized aqueous film-forming composition wherein the resulting film—

(a) has a minimum film-forming temperature (MFT) below about 30°C.,

(b) contains polymers having a glass transition temperature (Tg) less than about 20°C., and

(c) forms a substantially continuous film that is dry within minutes.

These aqueous film-forming compositions are applied to the entire fabric surface and wet the mites and their debris. When the water and organic solvent evaporate, a continuous polymeric film coats the mites and their debris, and bonds them to the fabric.

The films of this invention can be generally described as—

(a) hydrophobic,

(b) flexible,

(c) continuous, and

(d) autosoluble.

The coating compositions of the invention are only effective as long as the dust mite and its debris are immobilized and the mite is maintained under less than optimum growth conditions. For example, it is critical to the present invention that the film applied to various fabrics be hydrophobic. That is, the film itself should not absorb moisture and consequently aid in the support of the mite.

It has been found critical to controlling the activity of pyroglyphid mites in fabrics that the film be autosoluble. Thus, according to the present invention the films of the invention can be redissolved when a second coating composition of the invention is applied to the fabric. This autosolubility property is a function of the solubility of the polymer in the composition and the aerosol method of application. The pH of the coating composition can also be a factor.

The pressurized coating compositions of the invention produce flexible films which are substantive to the various fabrics treated. Generally, the films are from between about 0.01 and about 1 (one) micron in thickness. In a preferred embodiment of the invention, the films are from between about 0.1 and about 0.5 mils thick. The films have an MFT of less than about 30°C., and are substantially continuous when formed at ambient conditions, provided the fabric surface is substantially totally wetted with the aerosol spray.

Restriction of mite and mite debris mobility

The association of pyroglyphids with house dust allergy has been well documented. However, it is yet to be determined in what way mites are related to allergenic factors. There are three systems by which products from mites are thought to be deposited in house dust and in each of these systems the debris is readily mobile and tends to become airborne itself or as a part of a dust fiber. These systems are—

(1) the integumentary system contributes shed cuticle, molting fluids and glands with their secretions;

(2) the reproductive system produces eggs, seminal fluid and probably accessory materials from egg laying and copulation; and

(3) the digestive-excretory system contributes faecal material with a variety of components, and a gut lining very much like a peritrophic membrane.

Thus, it can be appreciated that the control of this mite debris is achieved in the present invention by the application of the pressurized coating compositions of the invention which binds the debris to the fabric, thereby reducing debris mobility. The pressurized coating compositions produce a quick-drying film which is substantially continuous and almost immediately upon application immobilizes the debris in the fabric. Further, the coatings of the invention are flexible, and thus are able to maintain their continuity and entrapment of the debris when the fabric is flexed. The net effect of treating fabrics infested with mites and debris with the pressurized coating compositions of the invention is the reduction of live mites in the fabric. Secondarily, the coated fabrics are substantially impenetrable

towards mites which may attempt to reinfest the fabric. Accordingly, the fabric surface is no longer a microenvironment ideally supportive of mite activity, and the mites will tend to seek other host environments, thereby reducing the allergy potential of the treated fabric.

Maintaining reduced moisture environment

The population growth of pyroglyphids is closely related to the absolute humidity of the indoor and outdoor air; almost every change in humidity is followed by a change in mite numbers and mite activity.

It has been established that standardized female North American house dust mites maintain a constant equilibrium water mass, independent of ambient water vapor activities above the critical equilibrium activity (CEA=.70 at 25°C). When confined to water vapor activities below the CEA, transpiration rate is greater than sorption rate and a net water loss is incurred for an increment of time.

Further, it has been established that the rate of water loss for mites held at dehydrated conditions is inversely proportional to the water vapor activity of the air. For example, for test water vapor activities of .525, .226 and .00, the rate of water loss is, respectively, 1.11, 1.40 and 1.77 percent hour^{-1} at 25°C. Mean survival time at these dehydrating activities is 69, 55 and 43 hours, respectively. Standardized females are 81 percent water by weight and tolerate water loss up to 46.5 percent before death occurs.

Thus, it can be appreciated that coating fabrics having high mite density with the pressurized compositions of the present invention can effectively control the mite's microenvironment and reduce mite populations. This control is attributed at least in part to the hydrophobic nature of the continuous, flexible films applied to the fabric. These coatings produce films that upon air drying have low water tension. These films tend to retain a moisture level less than required for mite subsistence, i.e., a CEA of less than 0.7 at 25°C. This results in an environment that is antagonistic to mite activity.

Isolate mites from critical nutrients

House dust mites prefer nutrients such as human skin scales, dandruff, dry hair, vegetable fibers including lint, yeast and gelatin. Coating fabrics where mites tend to collect with the pressurized coating compositions of the invention have been observed to restrict the availability of such nutrients to the mites. Moreover, since the coating composition itself is not a nutrient for the mite, the continuous coating compositions tend to control the activity of those mites not immobilized by starving them.

The polymer

The polymers suitable for the pressurized coating compositions of the invention can generally be described as being alkali or acid soluble, having a Tg of less than about 20°C., and capable of forming a film at less than 30°C. Generally the preferred polymers of the invention will have relatively low molecular weights. Such polymers are comprised of acidic functional or basic functional monomers and monomers containing a vinyl group. Suitable polymers contain monomers which can be further described as acid monomers, basic monomers, soft monomers, and optionally hydrophobic monomers.

Soft monomers are those monomers which produce flexible homopolymers having a brittle point below about 20°C. Preferred soft monomers are vinyl acetate; tha alkyl esters of acrylic acid wherein said alkyl group contains from 1—12 carbon atoms, such as methyl acrylate, ethyl acrylate, butyl acrylate, hexyl acrylate, 2-ethylhexyl acrylate and lauryl acrylate; and the higher alkyl esters of methacrylic acid wherein said higher alkyl group contains from 2—12 carbon atoms, such as butyl methacrylate, 2-ethylhexyl methacrylate and lauryl methacrylate. The preferred soft monomers are ethyl acrylate and butyl acrylate.

The acidic monomers are monoethylenically unsaturated compounds having at least one, and preferably only one, carboxylic acid group. Examples of such monomers include acrylic,methacrylic, itaconic, maleic and crotonic acids; monoalkyl esters of itaconic and maleic acids wherein said alkyl group contains 1—8 carbon atoms, e.g., methyl, ethyl, butyl, hexyl and octyl. The preferred acidic monomers are acrylic and methacrylic acids.

The basic monomers are monoethylenically unsaturated compounds having at least one, and preferably only one, basic functional group. Examples of such monomers include dimethylaminoethyl methacrylate, dimethylaminoethyl acrylate, t-butylaminoethyl methacrylate, t-butylaminoethyl acrylate, diethylaminoethyl methacrylate, diethylaminoethyl acrylate, 2-vinyl pyridine, dimethylaminophenyl acrylate, vinyl amine, and ethyleneimine. The preferred basic monomers are t-butylaminoethyl methacrylate and dimethylaminoethyl methacrylate.

Suitable hydrophobic monomers which can be included in the acrylic polymer are the lower alkyl methacrylates wherein said lower alkyl group contains 1—3 carbon atoms, such as methyl methacrylate, ethyl methacrylate and isopropyl methacrylate; cycloalkyl acrylates and methacrylates wherein said cycloalkyl group contains 5—7 carbon atoms, such as cyclohexyl acrylate and cyclohexyl methacrylate; and hard vinyl monomers such as styrene. The preferred hydrophobic monomers are styrene and the lower alkyl methacrylates, particularly methyl methacrylate.

Listed in Table I below are examples of preferred acidic functional polymers useful in the pressurized coating compositions of the invention. The composition of the polymers is described in weight percent of the monomers present. In addition, the glass transition temperature, Tg, of these

polymers is shown. It should be understood that the Tg range from —9°C. to 14°C. defines polymers that produce flexible films which would not tend to fracture upon flexing of the substrate.

TABLE I

Example	Monomer Content Weight Percent					
	EA[1]	MMA[2]	nBuA[3]	MAA[4]	AA[5]	Tg°C.
1	63	22	—	—	15	14
2	72	18	—	10	—	8
3	80	—	—	—	20	—4
4	—	—	60	40	—	—9
5	—	—	60	—	40	—9

Listed in Table II below are examples of preferred basic functional polymers useful in the pressurized coating compositions of the invention. The composition of the polymers is described in weight percent of the monomers present. In addition, the glass transition temperature, Tg, of these polymers is shown.

TABLE II

Example	Monomer Content Weight Percent					
	EA[1]	MMA[2]	nBuA[3]	tBAEMA[6]	DMAEMA[7]	Tg°C.
6	50	30	—	—	20	14
7	60	15	—	—	25	0
8	—	40	40	20	—	8
9	—	15	60	25	—	—22
10	—	20	55	—	25	—18

(1) EA = ethyl acrylate
(2) MMA = methyl methacrylate
(3) nBuA = normal butyl acrylate
(4) MMA = methacrylic acid
(5) AA — acrylic acid
(6) tBAEMA = tertiary butylaminoethyl methacrylate
(7) DMAEMA = dimethylaminoethyl methacrylate

The methods of producing the preferred polymers for the pressurized coating compositions of this invention are well known in the art and are generally prepared by the method of addition, emulsion polymerization. For example, the polymers of Table I can be prepared as follows: for each 100 parts of monomer used, 3 parts of a surfactant such as sodium lauryl sulfate and 0.5 parts of an initiator such as ammonium persulfate are mixed with 300 parts of distilled water. The emulsion polymerization is carried out by heating the sodium lauryl sulfate in water to 80°C. under an inert gas blanket in a reactor equipped with a stirring mechanism. The ammonium persulfate is first added and then the blend of monomers is slowly added to the aqueous mixture over a period of one hour. The reaction mixture is then maintained at reaction temperature for one hour and then cooled.

Auto solubility

Auto solubility is the property of the dried film that allows it to be partially or totally redissolved when exposed to a subsequent application of the film-forming composition. This property is necessary

to achieve optimum control of mite debris and mites themselves in fabrics which are exposed to continuing contamination by dander and other nutrients which attract mites. These include sheets, pillowcases and upholstery.

The process of auto solubility controls the amount of film redeposition that occurs on fabric upon repeated application of the pressurized compositions of this invention. Thus, not only are mites and mite debris trapped, but also contaminants such as dander. Compositions of this invention exhibit auto solubility when the polymer consists of an appropriate portion of pH-sensitive monomers and hydrophobic monomers, so that upon neutralization of the pH-sensitive portion of the polymer, the polymer changes from a state of non-solubility in aqueous medium to a state of solubility. This transition may be marked by changes in physical properties of the aqueous polymer composition, such as changes in viscosity and/or changes in optical density. The pH-sensitive monomers are collectively the acidic monomers referred to in Table I and the basic monomers referred to in Table II. Additionally, the degree of neutralization of the pH-sensitive moieties contained in the polymer affects the degree of auto solubility exhibited by the composition.

Auto solubility is achieved with the polymers of Table I by the addition of appropriate amounts of alkalis, for example ammonium hydroxide, morpholine, triethanol amine, sodium hydroxide, or other commonly known bases; to produce a solution with a resulting pH of between about 7 and about 10.

Similarly, auto solubility is produced with the polymers of Table II by the addition of appropriate amounts of acids, for example acetic acid, citric acid, phosphoric acid, hydrochloric acid, or other commonly known acids; to produce a solution with a resulting pH of between about 7 and about 4.

The solvent

The aqueous film-forming compositions of the present invention are applied to the fabric surface and wet the mites and the mite debris. For optimum control, the film should dry in a few minutes. Preferably, the solution dries within five minutes of spraying, leaving a polymeric film coating that has wetted the mites and mite debris and, therefore, bonds them to the fabric. Accordingly, it is critical for the purposes of the present invention that the coatings as applied to the substrate dry rapidly. It has been found that the addition of a relatively volatile organic solvent such as a low molecular weight alcohol to the polymer accelerates the drying rate. Preferred alcohols include ethyl, isopropyl, iso-butyl and tertiary butyl alcohols. In general, the organic solvent will be from about 5 percent to about 50 percent, preferably from about 5 to about 25 percent, by weight, of the total composition.

Examples of formulations of the film-forming composition suitable for use in the pressurized coating compositions of this invention are listed in Table III.

TABLE III

Example No.	Polymer		Neutralizer		Solvent		Water
	Described Above In Example No.	Concentration % By Weight	Type	Conc. % By Weight	Type	Conc. % By Weight	Conc. % By Weight
11	1	10	ammonia	0.4	ethanol	10	79.6
12	3	12	ammonia	1.2	isopropanol	20	66.8
13	5	5	triethanol amine	1.0	isobutanol	5	89.0
14	6	10	acetic acid	0.75	ethanol	5	84.25
15	8	8	acetic acid	0.4	isopropanol	15	76.6
16	9	12	–	–	ethanol	10	78.0

The propellant

It is critical for the purposes of the present invention that the film-forming composition be applied to the fabric in a controlled manner and that the dispensed material be dry to the touch shortly after application; for example, from about three to about fifteen minutes. It has been found that the sprayed composition need not penetrate deeply into certain fabrics such as upholstery, bedding, etc., to be effective in the control of mites. In fact, overwetting of the fabric can have detrimental effects such as prolonged drying time which reduces the immobilizing potential for mites. Additionally, alteration of the hand of the treated fabric can also result from overwetting. To this end, it has been found that the means of application is closely connected with the overall efficacy of the present invention. And the present invention teaches the control of the application of the film-forming composition by means of a self-pressurized aerosol propellant.

The preferred propellants are the liquefied hydrocarbons which are gaseous at room temperature, the liquefied halogenated hydrocarbons which are gaseous at room temperature, and inert compressible gases. Preferred hydrocarbon propellants include the saturated aliphatic hydrocarbons such as propane, butane, isobutane, n-pentane and isopentane. Preferred halogenated hydrocarbons include dichlorodifluoroethane, dichlorotetrafluoroethane, trichlorotrifluoroethane, and difluoromethane. Preferred inert compressible gases for use as propellants include nitrous oxide, nitrogen and carbon doxide. Mixtures of two or more propellants can be used. Other usable propellants include the normal and branched hexanes and heptanes.

The propellant is desirably utilized in an amount sufficient to expel the entire contents of the container. In general, the propellant will be from about 5 percent to about 50 percent, preferably about 5 percent to about 20 percent, by weight, of total composition. The compositions will generally be expelled from the containers as a foam or a wet surface spray. The pressure in the container will generally be from between about 5 and about 75 psig.

Pressurized coating compositions

The pressurized coating compositions of this invention comprise as specified herein:

(a) a polymer,
(b) water,
(c) an organic solvent, and
(d) a propellant.

The following examples are given to illustrate embodiments of the invention as it is presently preferred to practice it. It will be understood that these examples are illustrative and the invention is not to be considered restricted thereto except as indicated in the appended claims.

In order to achieve optimum characteristics of the propellant, small amounts of propellant stabilizer surfactants are added to the formulation, typically from about 1 to about 5 percent. Preferred stabilizer surfactants, known generically, are the polyoxyethylene sorbitan alkyls, the alkyl phenoxypolyethoxy ethanols, the polyoxyethylene alkyl esters, and the alkylaryl polyether alcohols.

EXAMPLE 17

Component	Described in:	Weight %
Polymer/Solvent	Example 11	87.0
Propellant	Isobutane	8.3
	Propane	1.7
Propellant Stabilizer	Octylphenoxy polyethoxy ethanol	3.0
		100.0%

EXAMPLE 18

Component	Described In:	Weight %
Polymer/Solvent	Example 12	81.0
Propellant	n-Butane	3.0
	Dichlorodifluoromethane	12.0
Propellant Stabilizer	Octylphenoxy polyethoxy ethanol	4.0
		100.0%

EXAMPLE 19

Component	Described In:	Weight %
Polymer/Solvent	Example 13	85.0
Propellant	Isobutane	10.8
	Propane	1.2
Propellant Stabilizer	Polyethylene oxide (4) Sorbitan monolaurate	3.0
		100.0%

EXAMPLE 20

Component	Described In:	Weight %
Polymer/Solvent	Example 14	76.0
Propellant	Isobutane	20.0
Propellant Stabilizer	Polyethylene oxide (20) Sorbitan trioleate	4.0
		100.0%

EXAMPLE 21

Component	Described In:	Weight %
Polymer/Solvent	Example 15	87.0
Propellant	Dichlorodifluoromethane	5.1
	Dichlorodifluoroethane	3.7
	n-Butane	1.2
Propellant Stabilizer	Polyoxyethylene (10) Stearyl ether	3.0
		100.0%

EXAMPLE 22

Component	Described In:	Weight %
Polymer/Solvent	Example 16	82.0
Propellant	Isobutane	12.5
	Propane	2.5
Propellant Stabilizer	Octylphenoxy polyethoxy ethanol	4.0
		100.0%

Application of the coating

It has been established that arthropods such as pyroglyphid mites have a peak growth period which occurs annually depending on the climate. For example, in temperate moist climates the peak growth period for these mites extends from July to October. In addition, it hs been observed that there is a high correlation between maximum indoor moisture level and living mites present during peak growth periods.

It has now been found that if certain optimum mite host fabrics found in households are treated with the compositions of the present invention prior to such peak growth periods, mite populations and debris populations will be substantially reduced and the allergy potential of these fabrics is correspondingly reduced. Thus, as described in Table IV, certain critical fabrics found in a household are selectively treated prior to and during the peak growth to control mite activity and to avoid reinfestation of mites, thereby reducing the allergy potential of the treated fabric.

There are certain areas of the typical household that are more supportive of mite activity than others. These include mattresses, bedding, upholstered furniture, and carpeting. The dense mite populations common to mattresses is attributed in part to the excessive amount of human scale and plant fibers present which are known preferred nutrients for mites. In addition, the mattress is considered to provide the optimum constant moisture level available in most households. Mites are found to live in the surface layer of the mattress. It can be understood why mattresses are considered the reservoir of pyroglyphid mite activity in most households and the source for mite reinfestation throughout the household. A preferred area of treatment for the present invention is the entire mattress surface and bedding. Preferably this treatment occurs periodically throughout the year.

EXAMPLES 23—31

Various pressurized coating compositions are described in Table IV below for application to various fabric substrates. These pressurized coatings produce quickly drying films which are hydrophobic, flexible, continuous, and auto soluble.

It will be apparent from the following examples that various pressurized coatings can be applied to a variety of fabrics in order to control mite activity and thereby reduce the allergy potential of the fabric.

It can be appreciated from these examples that a system of mite control can be developed for a typical household. Such a system will require periodic treatment of certain fabric surfaces and less frequent treatment of others. It is expected that if these treatments were maintained consistently on all critical fabrics in a household that mite activity and thereby allergy potential in a household could be reduced substantially.

The following table lists examples of the application of the compositions of Table III. As with the compositions of Table III, the applications represented are typical and neither exhaustive nor exclusive.

TABLE IV

Example	Coating Composition Described in Example	Fabric Surface Treated	Amount Applied g/sq.ft.	Drying Time Per Application/Minutes
23	17	Mattress	5	10
24	17	Carpet	10	15
25	18	Bedding	1	3
26	19	Upholstery	5	10
27	20	Mattress	5	10
28	20	Carpet	10	15
29	21	Mattress	5	10
30	21	Carpet	10	15
31	22	Bedding	1	3

CLAIMS

1. An article of manufacture suitable for controlling allergens in fabrics comprising—
(a) a pressurized container containing therein
(b) an aqueous film-forming coating composition,
(c) an organic solvent, and
(d) a propellant;
said composition when applied to a substrate by spraying from the aerosol container being quick drying to provide a substantially continuous film and said composition having a minimum film-forming temperature below about 30°C., and includes a hydrophobic polymer having a glass transition temperature less than about 20°C.

2. The article of manufacture according to claim 1 wherein the said polymer is comprised of acidic functional monomers and monomers containing a vinyl group.

3. The article of manufacture according to claim 2 wherein the polymer is comprised of carboxylic acid monomers, soft monomers and hydrophobic monomers.

4. The article of manufacture according to claim 3 wherein the carboxylic acid monomer is selected from the group consisting of methacrylic acid, acrylic acid and mixtures thereof and the monomer containing a vinyl group is selected from the group consisting of ethyl acrylate, methyl methacrylate, n-butyl acrylate and mixtures thereof.

5. The article of manufacture according to any one of claims 1 to 4 wherein the polymer includes an effective amount of acid monomer to render said polymer water soluble upon the addition of a base selected from the group consisting of ammonium hydroxide, morpholine, sodium hydroxide and triethanol amine.

6. The article of manufacture according to any one of claims 1 to 5 wherein the film has a MFT from between about —4 and 14°C.; the polymer component of the film has a Tg from between about —9 and 14°C.; the composition has a pH of from about 7 to about 10, and the film is auto soluble.

7. The article of manufacture according to any one of claims 1 to 6 wherein said organic solvent is a low molecular weight alcohol.

8. The article of manufacture according to claim 7 wherein said low molecular weight alcohol is present at from between 5 and 25 percent by weight and is selected from the group consisting of ethyl, isopropyl, isobutyl and tertiary butyl alcohol.

9. The article of manufacture according to claim 1 wherein the coating composition contains a

polymer comprised of monomers containing a basic functional group and monomers containing a vinyl group.

10. The article of manufacture according to claim 9 wherein the polymer is comprised of amino basic monomers, soft monomers and hydrophobic monomers.

11. The article of manufacture according to claim 10 wherein the amino basic monomer is selected from the group consisting of t-butylaminoethyl methacrylate, dimethylaminoethyl methacrylate and mixtures thereof and the monomer containing a vinyl group is selected from the group consisting of ethyl acrylate, methyl methacrylate, n-butyl acrylate and mixtures thereof.

12. The article of manufacture according to any one of claims 9 to 11 wherein the polymer includes an effective amount of basic monomer to render said polymer water soluble upon the addition of an acid selected from the group consisting of acetic acid, phosphoric acid, hydrochloric acid and citric acid.

13. The article of manufacture according to any one of claims 9 to 12 wherein the film has a MFT between about −15 and 14°C.; the composition has a pH of between 7 and 4, and the film is auto soluble.

14. The article of manufacture according to any one of claims 9 to 13 wherein said organic solvent is a low molecular weight alcohol which is present at a concentration from between about 5 and about 25 percent by weight and is selected from the group consisting of ethyl-, isopropyl-, isobutyl- and tertiary butyl-alcohol.

15. The article of manufacture according to any one of claims 1 to 14 wherein the propellant is selected from the group consisting of liquefied hydrocarbons, liquefied halogenated hydrocarbons and inert compressible gases.

16. The article of manufacture according to claim 15 wherein said propellant is selected from the group consisting of propane, butane, isobutane, n-pentane, isopentane, hexane, isohexane, heptane, isoheptane, dichlorodifluoroethane, dichlorotetrachloroethane, trichlorotrifluoroethane, difluoroethane, nitrous oxide, nitrogen, carbon dioxide and mixtures thereof.

17. The article of manufacture for controlling allergens in fabrics substantially as hereinbefore described and illustrated by reference to the foregoing Examples.

18. A fabric when treated with a composition, solvent and propellant as defined in Claim 1 to provide said fabric with a substantially continuous film and said composition having a minimum film-forming temperature below about 30°C., and includes a hydrophobic polymer having a glass transition temperature less than about 20°C.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1981. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.